

SECTION 1307

ACCEPTANCE TESTS FOR SEWERS

1307-1 GENERAL

1307-1.1 Description. - This work shall consist of testing sewers and force mains for leakage and deflection, and the furnishing of all necessary materials and equipment required. Deflection tests will be required for flexible pipe sewers only.

The air pressure test shall be the referee method used to determine watertight integrity of all sewers. The hydrostatic leakage test method will only be used when specifically ordered by the Engineer in writing.

This work shall be accomplished as specified in these specifications and the special provisions, and as directed by the Engineer.

Leakage test shall be performed on the entire sewer main installed, with the length of each test section limited to the pipe segment between manholes.

Deflection test for flexible pipe shall be run on the entire sewer system.

1302-1.2 Preparation of Sewer System. - Prior to performing leakage or deflection tests for acceptance, the sewer system installation shall be completed (laid, backfilled and compacted), and cleaned. Cleaning of the sewer system shall be in accordance to the provisions of Section 1308, "Cleaning Pipe Lines" of these City Standard Specifications.

1307-2 METHODS OF TESTING

1307-2.1 Air Pressure Test. - Air pressure test shall be in accordance with APWA Section 306-1.4.4, "Air Pressure Test."

1307-2.2 Hydrostatic Leakage Test. - When the hydrostatic leakage test, in lieu of air test, is ordered by the Engineer, the Contractor shall furnish all water, material and labor necessary to make the test. All testing shall be done in the presence of the Engineer and in accordance with the procedures as specified herein.

Each section of the sewer main to be tested shall be sealed by inserting stoppers in the lower end of the sewer segment, the inlet pipe of the upper manhole, and any side sewers at intervening manholes. The pipe and upstream manhole shall be filled with water to a point not less than 5 feet above the invert of the pipe or prevailing ground water elevation, whichever is higher. The line segment shall be filled approximately 4 hours prior to testing. The line shall be tested for at least 2 hours, maintaining the head specified above by measured additions of water. The sum of the additions of water added shall be the amount of leakage for the test period. When the amount of leakage, in a section tested, exceeds the maximum allowable, the Contractor shall locate the source of the leak or leaks and correct such leaks to the satisfaction of the Engineer. After the leak or leaks has been corrected, and the trench rebackfilled and compacted, the section of line shall then be retested to compliance.

The maximum allowable leakage tolerance for sewers is 500 gallons per inch diameter per mile of pipe per day, (0.066 gallons per minute per inch diameter per 1000 feet of pipe). The maximum allowable leakage tolerance for force mains

is 5 gallons per inch of diameter per mile of pipe per day, (0.0039 gallons per inch of diameter per 100 feet of pipe).

1307-2.3 Deflection Test. - The deflection test for flexible pipe sewer systems shall be performed by pulling a mandrel through the pipe line. The mandrel shall have a diameter equal to 95 percent of the inside diameter of the pipe system being tested. When the mandrel cannot be pulled through the pipe line the Contractor shall locate and correct the defect to the satisfaction of the Engineer. After the defect is corrected and trench backfilled, the section of line shall then be retested to compliance.

Deflection tests shall be performed not sooner than 30 days after completion of placement and densification of backfill. The pipe shall be cleaned and inspected for offsets and obstructions prior to testing.

The mandrel shall: (1) be a rigid, nonadjustable, odd number of legs (9 legs minimum), mandrel having an effective length not less than its nominal diameter; and (2) be fabricated of steel, fitted with pulling rings at each end, stamped or engraved on some segment other than a runner indicating the pipe material specification, nominal size and be furnished in a suitable carrying case labeled with the same data as stamped or engraved on the mandrel.

The mandrel shall be pulled through the pipe by hand to ensure that maximum allowable deflections have not been exceeded. Prior to use, the mandrel shall be certified by the Engineer. Use of an uncertified mandrel or a mandrel altered or modified after certification will invalidate the test. If the mandrel fails to pass, the pipe will be deemed overdeflected.

Overdeflected pipe shall be uncovered and, if not damaged, reinstalled within 45 calendar days of its removal. Damaged pipe shall not be reinstalled, but shall be removed from the work site. Any pipe subjected to any method or process other than removal, which attempts, even successfully, to reduce or cure overdeflection, shall be uncovered, removed from the work site and replaced with new pipe. The replaced pipe shall be tested for deflection not sooner than 30 days after installation.

1307-3 TELEVISION INSPECTION. - After all testing specified in this section has been satisfactorily completed, the entire tested sewer shall be given a television inspection. The Contractor shall inspect internal sanitary sewer mains by color television camera and the inspection shall be recorded in magnetic medium, as specified hereinafter. Television inspection shall be performed before and after installation of the liner. Cleaning of the existing sanitary sewer shall be performed prior to the television inspection by a separate operation.

The inspection shall be recorded in true color in Beta Max II or VHS ("SP") Cassette format with on-screen footage readout on the lower part of the screen.

A written log in City of San Jose Standard Television Inspection format (available from the Engineer) shall accompany the recorded cassette. Including the following information shall accompany the recorded cassette:

- 1) Date
- 2) Tape Number
- 3) Location
- 4) Pipe Material and Size
- 5) Name of Equipment Operator

- 6) Name of Firm Performing the Inspection
- 7) All deficiencies in the sewer installation shall be noted and their location referenced to their on-screen footage readout

The recorded cassette and accompanying report shall be delivered to the Engineer not later than 24 hours after completion of the inspection. The cassette and report shall become the property of the City. The Engineer will review the recorded television inspection and will notify the Contractor whether:

- 1) The review revealed a satisfactory installation, or
- 2) The review revealed deficiencies

The Contractor may review the recorded television inspection by requesting and arranging the review with the Engineer.

The following deficiencies in sanitary sewer liner installation shall be corrected by the Contractor at no cost to the City:

- 1) Joint separation (if applicable)
- 2) Offset joints (if applicable)
- 3) Cracked or damaged liner pipe
- 4) Infiltration points
- 5) Debris in the line

The City will not accept a credit, maintenance bond, or any other form of compensation in lieu of corrective measures that may be required to correct any sections of sewer that are improperly installed or do not meet the requirements of these specifications. In addition, all corrective measures proposed by the Contractor shall be approved by the Engineer. In addition, should repairs of the sewers be accomplished by the use of any unauthorized materials or procedure, the Engineer will require replacement of those substandard portions or repairs made to conform to the requirements of these specifications.

Upon completion of repairs the sewer main shall be TV inspected and the recorded TV inspection will be reviewed by the Engineer. This process shall be repeated until the review of the recorded television inspection reveals a satisfactory installation.

1307-4 MEASUREMENT AND PAYMENT. - The work specified in this section will not be separately measured for payment. Full compensation for the acceptance tests specified in this section shall be considered as included in the various contract unit prices paid for sewer pipe and no additional compensation will be allowed therefor.